

Status of the claims

Claims 1-20 are pending. Claims 9-20 have been withdrawn.

REMARKS

In an Office Action mailed on November 29, 2005, the Examiner rejected claims 1-8 under 35 U.S.C. § 112, second paragraph. The Examiner also rejected claims 1-8 as obvious over *Matijevic* (U.S. Pat. 5,318,797) in view of an article entitled "Carboxylate alumoxanes: Environmentally benign precursors for developing aluminum-based ceramic membranes and filters" (*Jones*) or an article entitled "An investigation of carboxylate-alumoxanes as surface repair agents for ceramic bodies and thermal barriers for carbon composites" (*DeFriend-Varela*).

Applicants respectfully traverse the rejections for the reasons set out below.

§112 Rejection of Claims 1-8

The Examiner rejected claims 1-8 under 35 U.S.C. §112 for not providing enablement for one coating cycle. The Examiner recited the following language from the specification in support of the rejection:

The number of coatings is important in obtaining a structurally sound alumina sphere. It was found that three coating/drying cycles were preferred to provide an alumoxane shell with good shape retention and uniformity. If a single coating/drying cycle was used, the spheres collapsed upon firing to 1000°C.

Applicants note that claim 1 does not include any limitation requiring firing to 1000°C. Applicants also reference page 17, line 5 of the specification, which states "the solvents, washes and temperatures and pressures of the processing steps can be varied, so long as the desired composition is formed." In addition, Applicants note that original claim 5 depends from claim 1 and requires only that the second temperature (*i.e.*, the temperature "sufficient to form a hollow ceramic sphere of desired porosity and strength") is above 600°C. The fact that spheres produced with a single coating / drying cycle may collapse upon firing to 1000°C does not result in the specification failing to enable claims 1-8. The portions of the specification cited above demonstrate that it is not necessary to fire the spheres to 1000°C. Therefore, in some instances, namely those in which the spheres will not be fired to 1000°C and those in which collapsed spheres are acceptable, spheres may be produced with a single coating / drying cycle.

For these reasons, Applicants respectfully submit that the specification enables one skilled in the art to practice the invention of claims 1-8, and that the rejection under 35 U.S.C. §112 should be withdrawn.

§103 Rejection of Claims 1-8

In issuing the obviousness rejection under 35 U.S.C. §103, the Examiner stated *Matijevic* “teaches a method similar to the claimed method except that the coating material is an aluminum hydroxide (col. 19, lines 40-42) instead of alumoxane as claimed.” In addition to the distinction noted by the Examiner, *Matijevic* fails to disclose other limitations required by the claimed invention. For example, claim 1 requires “heating the beads to a first temperature, wherein the first temperature is sufficient to convert the alumoxane to an amorphous alumina or aluminate coating and is not sufficient to decompose the polymeric beads” and “dissolving the beads in a solvent[.]”

In contrast, *Matijevic* teaches the following method for removing the polymer core to create a hollow particle:

The spherical hollow particles of the present invention can be prepared from the polymer-metal compound coated spherical particles by heating them at a temperature of 150° C. or higher in the presence of air or oxygen to *completely decompose the polymer core* into gases and by emitting the gas through the shell. (emphasis added).

Matijevic, col. 6, ll. 52-61. Thus *Matijevic* clearly teaches away from methods in which the polymeric beads are not decomposed.

In order to establish a *prima facie* case of obviousness, the Examiner must demonstrate, *inter alia*, that the prior art references teach or suggest all the claim limitations. See MPEP § 706.02(j). The Examiner has not demonstrated that either *Matijevic*, *Jones* or *DeFriend-Varela* teach a method that includes heating the polymer beads to a temperature that is not sufficient to decompose the beads, nor do they teach dissolving the beads in a solvent.

For at least these reasons, Applicants respectfully submit that it would not have been obvious to one having ordinary skill in the art to combine *Matijevic* with *Jones* or *DeFriend-Varela* to practice the invention of claim 1. Hence, Applicants respectfully submit that claim 1 is distinguishable over *Matijevic* in view of *Jones* and *DeFriend-Varela* and the rejection under 35


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U.S.C. §103 should be withdrawn. Claims 2-8 depend from claim 1, and are therefore allowable for at least the reasons set forth for claim 1 above.

Conclusion

Applicants believe that they have fully responded to the Office Action. If the Examiner has any questions or comments, or otherwise feels it would be advantageous, the Examiner is encouraged to telephone the undersigned at (713) 238-8043.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Marcella D. Watkins", written over a horizontal line.

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